

Self-Compassion in Recovery Following Potentially Traumatic Stress: Longitudinal Study of At-Risk Youth

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Abstract Despite promising theory, empirical study of the putative protective properties of self-compassion (SC) with respect to resilience to and recovery from traumatic stress is limited. The present study tested the theorized protective role(s) of SC with respect to trauma-related psychopathology over time among an at-risk sample of adolescents ($N=64$, 26 % females, $M(SD)_{age}=17.5(1.07)$ years-old, range $age=15-19$; grades 9–12) directly exposed to a potentially traumatic stressful event – the Mount Carmel Forest Fire Disaster. The longitudinal design involved three assessment time-points – within 30-days of the potentially traumatic event (T1) and then at 3- (T2) and 6-months (T3) follow-up intervals. Consistent with prediction, multi-level modeling of mediation documented the prospective protective function(s) of SC, above and beyond dispositional mindfulness, with respect to posttraumatic stress and panic symptoms, depressive symptoms, and suicidality symptoms, but not well-being. The findings are discussed, theoretically, with respect to SC as a malleable protective factor for trauma-related psychopathology outcomes; and, clinically, with respect to SC as a target for future trauma-related selective-prevention and -early intervention research.

Keywords Adolescents · Compassion · Developmental psychopathology · Longitudinal · Protective factor · Self-compassion · Stress · Trauma · Risk factor · Youth

We have much to learn about malleable causal risk and protective factors underlying the development of trauma-related psychopathology including posttraumatic stress, depression, panic, and related disorders (Bomyea et al. 2012; Brewin et al.

2000; Brewin and Holmes 2003; Elwood et al. 2009). Such knowledge is essential for guiding the development of trauma-related prevention and early intervention (Feldner et al. 2007). A range of factors have been theorized as relevant to trauma resilience and recovery, yet have received relatively limited direct empirical study. One such promising construct is *self-compassion* (SC). Accordingly, the present study explores the role(s) SC in recovery following traumatic stress.

Compassion & Self-Compassion Growing attention to compassion in the clinical psychological science literature is linked to the field's broader adoption of principles and techniques central to Buddhist traditions (Hayes et al. 2011; Hofmann et al. 2011). Compassion is one of four Brahmaviharas also known as the four immeasurables – compassion, loving-kindness, joy, and equanimity (Kraus and Sears 2009). In Theravada, Mahayana, and Tibetan Buddhist traditions, compassion is broadly conceptualized as the desire to prevent suffering from happening to others and one's self (Davidson and Harrington 2001; Tirsch 2010). In contemporary psychological literature, a number of theorists have proposed alternative, albeit related, conceptual models of compassion and SC broadly consistent with the Buddhist conceptualization (Gilbert and Procter 2006; Neff 2003a; Ozawa-de Silva et al. 2012). For example, Neff (2003a) conceptualized SC as feelings of care and kindness toward oneself through taking an understanding, non-judgmental attitude towards one's perceived inadequacies, recognizing that one's personal experience is connected to the greater collective human experience and by a willingness to be open to one's own suffering without avoiding it (see also Neff 2003b).

Self-Compassion and Recovery from Traumatic Stress: Conceptual Rationale We theorize that the more compassionately a person relates towards her/his self following exposure to traumatic stress, the more likely that person may be to: (a)

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recognize the need to care for oneself and thereby engage in self-care behaviors or benefit from social support (e.g., Allen and Leary 2010; Neff 2003b); (b) permit oneself to experience rather than avoid painful thoughts, emotions and physical sensations often experienced post-trauma and thereby facilitate emotional processing of the event (e.g., Thompson and Waltz 2008); (c) engage in less ruminative self-blame or related self-criticism (e.g., Gilbert and Procter 2006; Leary et al. 2007; Raes 2010); and (d) experience the memory of the event from a more decentered or self-distanced perspective – as an emotionally painful experience rather than as an experience that defines or changes oneself per se (e.g., Kross and Ayduk 2011; Neff 2003b). Consistent with such theorizing, there is a growing body of empirical research documenting the salutary role of SC for stress-related disorders such as mood and anxiety disorders (Neff 2003a; Neff et al. 2007; Raes 2011), as well as preliminary evidence of its protective role with respect to trauma-related psychopathology more specifically (Thompson and Waltz 2008). We focus on the latter below.

Cross-Sectional Study In addition to a number of cross-sectional studies linking SC to depression, anxiety and related symptoms (Neff 2003a; Neff et al. 2007; Neff et al. 2008; Neff and McGehee 2010; Raes 2010; Van Dam et al. 2011; see MacBeth and Gumley 2012 for meta-analytic review), a number of studies have begun to evaluate the association between SC and trauma-related psychopathology specifically. Thompson and Waltz (2008) found that SC was related to reduced levels of PTSD avoidance symptom severity specifically among a non-clinical trauma-exposed sample (Thompson and Waltz 2008). Tanaka et al. (2011) found that higher levels of childhood emotional abuse, emotional neglect and physical abuse were associated with lower levels of SC; and that adolescents with lower SC levels were more likely to suffer from psychological distress leading to problems with substance abuse and in some instances attempted suicide among a sample of at-risk youth receiving child protective services. Relatedly, Vettese et al. (2011) found that SC concurrently mediated the association between childhood maltreatment and later adolescent emotional dysregulation in a sample of youth seeking treatment for substance abuse above and beyond other risk factors including childhood maltreatment history, current psychological distress and addiction severity.

Longitudinal Study To the best of our knowledge, only one longitudinal study has evaluated relations between SC, psychopathology, and related outcomes. Raes (2011) found that among a large non-clinical university student sample, greater levels of SC at one time-point predicted reduced levels of depression symptoms at a 5-month follow-up (Raes 2011). To the best of our knowledge, no study has yet to test the

prospective protective role(s) of SC following exposure to major life or potentially traumatic stress on trauma-related outcomes.

Experimental Laboratory Study A number of controlled laboratory studies have begun to test the effects of experimentally manipulating compassion and SC (i.e., via Loving Kindness Meditation or Compassion Meditation) on a variety of affective, social and neural outcomes (Hutcherson et al. 2008; Lutz et al. 2004, 2008). With respect to stress and trauma, Leary and colleagues (2007) instructed participants to recall and describe a negative autobiographical memory of a past event experienced as a failure. Relative to an active self-esteem condition and two control conditions, participants randomized to the SC condition reported lower levels of negative affect and were more likely to acknowledge their role in the event (Leary et al. 2007). To the best of our knowledge, no other experimental investigation has directly tested the protective role(s) of dispositional SC or experimentally manipulated levels of SC on responding to a novel stressor in the lab, such as on emotional recovery or avoidance behavior.

Intervention & Prevention Study A number of intervention studies have begun to test the salutary effects of compassion and SC on mood and anxiety-related outcomes (i.e., Fredrickson et al. 2008; Gilbert and Irons 2004, Gilbert and Procter 2006; Neff et al. 2007; Shapira and Mongrain 2010), as well as on responding to stress or trauma-related stress more specifically. Reddy and Colleagues (2012) found, in an uncontrolled test, that a 6-week Cognitive Based Compassion Training program (CBCT), delivered to at-risk adolescents in foster care, led to elevations in hopefulness and reduced levels of generalized anxiety as a function of the frequency of CBCT practice. In a randomized control design, Pace and colleagues (2009) found that relative to a health discussion control condition, compassion meditation led to improved immune (plasma concentrations of interleukin IL-6 related to down-stream inflammation and disease), neuroendocrinological (cortisol), and subjective distress. However, at 2–4 weeks post-intervention, no group differences were observed with respect to responding to a laboratory-based psychosocial stressor (Trier Social Stress Test). Furthermore, greater levels of CM practice among the CM condition were related to reduced IL-6 and distress scores, but not cortisol levels, in response to the stressor. Finally, in a randomized control study, participants seeking therapy following a traumatic event were randomized to CBT or CBT-plus-CMT (Beaumont et al. (2012). Both intervention conditions demonstrated significant reductions in depression, anxiety, and other posttraumatic stress symptoms; though the CBT-CMT group also demonstrated elevations in SC. To the best of our knowledge, no prevention study

targeting SC has been conducted to-date; nor has an early intervention study tested the preventive role of SC for resilience or recovery from trauma or related stress exposure.

Gaps in Extant Research on Self-Compassion and Trauma Recovery Research has yet to test the role(s) of SC preceding or immediately following traumatic stress exposure for psychopathology risk. Developmentally-oriented, prospective study is particularly needed – to test the putative protective role(s) of SC for the development and maintenance of stress- and trauma-related psychopathology outcomes. Furthermore, in light of the developmental emergence and long-term implications of stress-related disorders among youth, and at-risk youth in particular (Costello et al. 2006; Grant et al. 2004), a developmental psychopathology perspective on SC and trauma recovery may be particularly informative. Theoretically, by reducing the effects of (life-long) retrospective censored observations (e.g., past traumatic stress exposure, psychiatric history, etc.) among adults, that may bias prospective study of SC and trauma-related adjustment, study among youth may be particularly informative. Clinically, prospective study among youth at elevated risk of poor adjustment post-trauma (i.e., at-risk youth) may be important for identifying candidate malleable risk/protective factors, such as SC, to target in novel trauma-related selective-prevention or -early intervention programs.

Specific Aims Accordingly, we tested the prospective association between SC and resilience to and recovery from a recent (past 30-day) potentially traumatic stressor at three time-points over a 6-month time-period, among a sample of at-risk adolescents. Specifically, we tested the extent to which SC prospectively mediated the effect of time, following exposure to the traumatic stressor, on transdiagnostic trauma-related psychopathology symptoms, including posttraumatic stress, depression, panic, and suicidality symptoms, as well as well-being. We also tested the incremental predictive validity of SC above and beyond the effect of dispositional mindful attention and awareness, an alternative and theoretically related protective factor (Tirch 2010; Van Dam et al. 2011).

Method

Participants

Data were collected from a convenience sample of 64 high-school students (26.6 % female; $M(SD)_{age}=17.5(1.07)$ years-old, range_{age}=15–19; grades 9–12) living in an educational residential youth village in northern Israel. Participants were sampled across the entire institution, rather than from nested

groups within the institution (e.g., grades) so as to methodologically maximize the independence of observations between sampled youth appropriate for a 2-level mixed multi-level model design (i.e., level 1 = repeated measurements, level 2 = participants).¹ The youth village is not a mental health treatment facility but a residential educational facility. 92.1 % of the sample were Ethiopian Jews, 6.3 % Jews from the Former Soviet Union, and one participant (1.6 %) was not an immigrant. None were forcibly displaced persons, refugees or asylum seekers. All spoke and read Hebrew fluently. In terms of socio-economic status, 61 % of the sample reported “much below average” and an additional 22 % “below average”. The youth village reports that approximately 50 % of their students originate from homes struggling with various chronic stressors including poverty, violence, and substance abuse; and approximately 20 % of the students are orphans. Consistent with conceptualization of the stressor as potentially traumatic, at T1 (within 30-days of the fire) 88 % participants reported that they feared that their life and/or the lives of those close to them were threatened (e.g., friends, relatives), and/or felt helpless and/or horror over the course of the fire (see below for details).

The study received human subjects research ethics approval through a University of Haifa IRB committee. Informed written consent for participation was provided, first, by the institutional director and legal guardian of the youth; and second, by each adolescent participant. Participants received up to 120NIS (\$30) in exchange for participation in a total of three 1-hour assessment sessions.

Procedure

Participants were recruited immediately following the Carmel Fire Disaster—a large, week-long, forest fire (December, 2010) that led to emergency evacuation and destruction of local communities, including injuries and deaths (Bronner 2010). The youth village was evacuated and about 40 % of the structures were destroyed by the fire, displacing the youth during the week-long fire and in subsequent weeks. Recruitment was initiated only once the fire no longer acutely threatened local communities including the youth village. Study inclusion criteria included: (a) a minimum Hebrew reading at sixth grade-level; (b) proximal exposure to the recent (past 30-day) potentially traumatic stressor. The first

¹ Students belonged to multiple within-grade class units, such that only 4 possible level-3 groups (i.e., grades) may be tested. There were therefore an insufficient number of potential level-3 units to test the relative improved fit of a 3- relative to 2-level models. An insufficient number of groups at level-3 relative to parameters to be estimated results in problems with model convergence, unreliable level-3 parameter estimates, and underpowered level 3 analyses (Singer and Willett 2003; Tasca et al. 2009). Accordingly, sampling of youth was designed a priori to maximize independence of observations for a 2- rather than 3-level model.

assessment session was held within 4-weeks of (following) the fire (T1), and then ~3-months post- (T2), and ~6-months post-fire (T3). At T2, 88 % of participants who participated at T1 were retained, and at T3, 70 % of participants who participated at T1 and 80 % of participants who participated at T2 were retained. The retention rate would have likely been higher but a number of participants graduated and drafted to military service between T2 and T3. Moreover, observed prospective retention rates may be considered high in light of the nature of the high-risk youth population and fully sufficient to conduct the proposed mixed multi-level modeling analyses reliably (Singer and Willett 2003).

Participants were invited to the school computer laboratory where they completed the assessment (~ $n=10$ per group). Participants were seated at a sufficient distance (not at adjacent computer stations) from one another to ensure their privacy. School staff were not present during the assessment session, and full confidentiality of participant's reports was guaranteed to youth participants to facilitate sound self-report. Participants were told that their responses would not be shared in any way with the institutional staff, unless a participant reported that she/he was in immediate physical danger (e.g., serious suicidal ideation). Members of the research team were present during all assessment sessions.

Measures

Translation and Back-Translation Process The measures were translated from English to Hebrew by laboratory staff fluent in Hebrew and English. The scales were then back-translated by a separate party using structured guidelines (Geisinger 1994).

Descriptive Demographic Measures Participants provided demographic and related personal background information (religion, race/ethnicity, age, gender).

Self Compassion Scale (SCS; Neff 2003a) SCS is a 26-item self report questionnaire consisting of a total score composed of six dimensions of SC including Self-kindness ("When I'm going through a very hard time, I give myself the caring and tenderness I need"), Self-judgment ("When times are really difficult, I tend to be tough on myself"), Common humanity ("I try to see my failings as part of the human condition"), Isolation ("When I think about my inadequacies it tends to make me feel more separate and cut off from the rest of the world"), Mindfulness ("When something upsets me, I try to keep my emotions in balance"), and Over-identification ("When something upsets me I get carried away with my feelings"). SCS items were designed to measure SC in times of difficulty and thus selected for the present investigation. Items are rated on a 5-point Likert-type scale (1 = *never* to 5 = *almost always*). The SCS has demonstrated multiple forms of

reliability and validity (Neff 2003a, b). As in extant study of SC, we utilized the SCS-total score rather than separate dimensions or sub-scales because it best reflects the SC constructs (Neff 2003a) and to reduce the number of analyses. Internal consistency in these data were acceptable (Cronbach's $\alpha=0.64$), but lower than some earlier reported levels (Neff 2003a).

The Inventory of Depression and Anxiety Symptoms (IDAS; Watson et al. 2007) The IDAS is a factor-analytically derived, multidimensional inventory that uses a 5-point Likert-type scale (1 = *not at all* to 5 = *Extremely*) to assess current symptoms. In the proposed study, we focus a priori on symptoms of psychopathology related to traumatic stress, including general depression, suicidality, panic, posttraumatic stress and well-being sub-scales, experienced in the past 2-weeks. The IDAS has demonstrated strong internal consistency, test-retest reliability, and good convergent and discriminant validity with respect to formal diagnostic and self-report symptom measures in multiple populations (Watson et al. 2007). Internal consistency of the IDAS sub-scale scores were good to excellent (Cronbach's α 's=0.79 to 0.93), consistent with past work (Watson et al. 2007).

Mindful Attention Awareness Scale (MAAS; Brown and Ryan 2003) The MAAS is a 15-item questionnaire in which respondents indicate, on a 6-point Likert-type scale (1 = *almost always* to 6 = *almost never*), their level of dispositional awareness and attention to present events and experiences (Brown and Ryan 2003). Sample MAAS items include "I rush through activities without being really attentive to them" and "I find it difficult to stay focused on what's happening in the present." The MAAS has demonstrated good internal consistency across a range of samples ($\alpha=0.80-0.87$), and strong test-retest reliability data over a 1-month time period ($r=0.81$; Brown and Ryan 2003). Internal consistency of the MAAS total score was excellent (Cronbach's $\alpha=0.88$), consistent with past work (Brown and Ryan 2003).

Carmel Trauma Questionnaire (CTQ) The CTQ is an 8-item self-report questionnaire, developed in our laboratory for the purpose of this study to assess relevant information related to the Carmel fire disaster specifically, such as proximity to the fire, injury to the participant or relatives, property damage and related information. In addition, participants were asked to answer general questions about their feelings during the fire ("Did you feel that your life was in danger?"). The CTQ was grounded in established measures of traumatic stress exposure and posttraumatic stress, including the Posttraumatic Diagnostic Scale and the Clinician Administered Posttraumatic Stress Scale structured interview. This measure was used only to gain descriptive data regarding participants' exposure to the potentially traumatic stress event.

Results

Multilevel Modeling of Mediation: Data Analytic Strategy All data analyses were carried out in SPSS. We tested multi-level models of mediation in which time (T1, T2, T3) was the predictor, SC was the mediator, and trauma-related symptoms (depressive, panic, posttraumatic stress, and suicidality symptoms) and well-being were the outcomes (Kenny et al. 2003). The models were lagged such that SC at time T predicted symptom outcomes at time T + 1. The model used the diagonal covariance error structure matrix. The variables standardized to facilitate interpretation of the path coefficients across models. Finally, in the event that a null effect of time was observed, we re-ran the MLM of mediation but without the lag. Because we collected data at 3 time-points, the lag reduces the statistical power of the MLM to detect an effect of time and thus a non-lagged analysis is important to rule-out a null effect of time due to this potential methodological artifact (Singer and Willett 2003). See Table 1 for descriptive statistics for all studied variables.

Depressive Symptoms Depressive symptoms levels did not change significantly over time ($\beta=0.26$, $SE=0.16$, $t=1.7$, $p=0.11$). SC levels decreased significantly over time ($\beta=-0.48$, $SE=0.18$, $t=-2.7$, $p<0.01$). Finally, we regressed depressive symptoms on both time and SC simultaneously. The effect of SC was significant, indicating that higher levels of SC at time T1 and T2 predicted lower levels of depressive symptoms at T2 and T3, respectively ($\beta=-0.23$, $SE=0.09$, $t=-2.3$, $p<0.05$). The effect of time remained non-significant ($\beta=0.16$, $SE=0.16$, $t=0.97$, $p=0.35$), indicating that time did not have an additional effect on depressive symptoms above and beyond the effect of SC. The model explained 25 %² of the variance in Depressive symptoms (pseudo- $r^2=0.25$; Singer and Willett 2003).

As planned, because there was no significant change of depressive symptoms over time in the lagged model, we re-ran a non-lagged MLM of mediation. Depressive symptoms levels did not change significantly over time though a trend nearing significance was observed ($\beta=0.17$, $SE=0.09$, $t=1.9$, $p=0.06$). SC levels decreased significantly over time ($\beta=-0.22$, $SE=0.09$, $t=-2.4$, $p<0.05$). Finally, we regressed depressive symptoms on both time and SC simultaneously. The effect of SC was significant, indicating that higher levels of SC at time T1, T2 and T3 predicted lower levels of depressive symptoms at T1, T2 and T3, respectively ($\beta=-0.25$, $SE=0.08$, $t=-3.3$, $p<0.01$). The effect of time remained non-significant ($\beta=0.12$, $SE=0.09$, $t=1.3$, $p=0.20$), indicating that time did not have an additional effect on depressive symptoms above

and beyond the effect of SC. This model explained 15 % of the variance in Depressive symptoms (pseudo- $r^2=0.15$)

Panic Symptoms Panic symptoms rose significantly over time ($\beta=0.31$, $SE=0.15$, $t=2.03$, $p<0.05$). We then regressed SC on time (see above). Finally, we regressed panic symptoms on both time and SC simultaneously. The effect of SC was significant, indicating that higher levels of SC at time T1 and T2 predicted lower levels of panic symptoms (i.e., less elevation or reductions in symptoms) at T2 and T3, respectively ($\beta=-2.01$, $SE=0.64$, $t=-3.16$, $p<0.01$). The effect of time became non-significant ($\beta=1.88$, $SE=1.16$, $t=1.62$, $p=0.11$), indicating that time did not have an additional effect on panic symptoms above and beyond the effect of SC; SC thus fully mediated the effect of time on panic symptoms. This model explained 32 % of the variance in panic symptoms (pseudo- $r^2=0.32$)

Posttraumatic Stress Symptoms Posttraumatic stress symptoms rose significantly over time ($\beta=0.31$, $SE=0.13$, $t=2.34$, $p<0.05$). We then regressed SC on time (see above). Finally, we regressed posttraumatic stress symptoms on both time and SC simultaneously. The effect of SC was significant indicating that higher levels of SC at time T1 and T2 predicted lower levels of posttraumatic stress symptoms (i.e., less elevation or reductions in symptoms) at T2 and T3, respectively ($\beta=-0.17$, $SE=0.08$, $t=-2.02$, $p<0.05$). The effect of time became non-significant ($\beta=0.21$, $SE=0.14$, $t=1.49$, $p=0.15$), indicating that time did not have an additional effect on posttraumatic stress symptoms above and beyond the effect of SC; SC thus fully mediated the effect of time on posttraumatic stress symptoms. This model explained 14 % of the variance in trauma symptoms (pseudo- $r^2=0.14$).

Suicidality Symptoms Suicidality levels did not change significantly over time ($\beta=0.22$, $SE=0.16$, $t=1.42$, $p>0.05$). We then regressed SC on time (see above). Finally, we regressed suicidality on both time and SC simultaneously. The effect of SC was significant, indicating that higher levels of SC at time T1 and T2 predicted lower levels of suicidality symptoms at T2 and T3, respectively ($\beta=-0.22$, $SE=0.09$, $t=-2.38$, $p<0.05$). The effect of time remained non-significant ($\beta=0.15$, $SE=0.16$, $t=0.89$, $p>0.05$), indicating that time did not have an additional effect on suicidality symptom levels above and beyond the effect of SC. This model explained 15 % of the variance in suicidality symptoms (pseudo- $r^2=0.15$).

As planned, because there was no significant change in suicidality symptoms over time in the lagged model, we re-ran a non-lagged model. Suicidality levels rose significantly over time ($\beta=0.22$, $SE=0.09$, $t=2.51$, $p<0.05$). We then regressed SC on time (see non-lagged model above). Finally, we regressed suicidality on both time and SC simultaneously. The effect of SC was significant, indicating that elevation in

² Pseudo- $r^2 = \text{sigma-hat}_e^2$ (unconditional means model) - sigma-hat_e^2 (unconditional growth model) / sigma-hat_e^2 (unconditional means model)] (Singer and Willett 2003, p. 103)

Table 1 Descriptive statistics of studied variables over time post-trauma

	Time 1 (N=64)	Time 2 (N=56)	Time 3 (N=45)	
	<i>M (SD)</i>			
T1 < 4-weeks post-trauma; T2 = ~3-months post-trauma; T3 = ~6-months post-trauma. Self Compassion Scale (SCS; Neff 2003a); Mindful Attention Awareness Scale (MAAS; Brown and Ryan 2003); The Inventory of Depression and Anxiety Symptoms (IDAS; Watson et al. 2007)	SCS - Self-compassion	84.2 (9.6)	80.1 (6.4)	81.1 (5.8)
	MAAS - Mindfulness	67.4 (13.2)	60.6 (17.6)	64.5 (15.8)
	IDAS - Depressive symptoms	39.6 (12.5)	40.4 (12.7)	43.2 (13.8)
	IDAS - Panic symptoms	13.2 (6.6)	12.9 (6.8)	15.8 (8.6)
	IDAS - Posttraumatic stress symptoms	7.3 (3.4)	7.0 (3.7)	8.3 (4.1)
	IDAS - Suicidality symptoms	8.0 (3.6)	9.3 (5.3)	10.2 (5.3)
	IDAS - Well-being	23.5 (4.2)	23.8 (4.1)	22.5 (3.7)

SC at time T1, T2 and T3 significantly predicted reduction in suicidality symptoms (i.e., less elevation or reductions in symptoms) at T1, T2 and T3, respectively ($\beta=-0.20$, $SE=0.08$, $t=-2.51$, $p<0.05$). The effect of time became non-significant ($\beta=0.18$, $SE=0.09$, $t=1.92$, $p=0.58$), indicating that time did not have an additional effect on suicidality symptoms above and beyond the effect of SC; SC thus fully mediated the effect of time on suicidality. This model, however, explained only 3.4 % of variance in suicidality (pseudo- $r^2=0.034$).

Well-Being We tested the degree to which SC mediated the effect of time on well-being. The model demonstrated no significant effects, neither for time nor for SC; a non-lagged model similarly demonstrated no effects of time nor SC.

Incremental Validity of Self-Compassion beyond Dispositional Mindfulness for Trauma-Related Symptom Outcomes Finally, we tested the incremental effect of SC above and beyond the effect of dispositional mindfulness (MAAS) on all symptom outcomes. However, MAAS scores did not explain significant variance in any symptom outcome nor change the reported associations between SC scores and symptom outcomes. MAAS scores were thus omitted from the MLM models of mediation.

Discussion

Scholars have increasingly focused on the role(s) of SC for mental health broadly and for the development and maintenance of stress- and trauma-related psychopathology more specifically (MacBeth and Gumley 2012). Yet, despite promising theory, empirical study of the putative protective properties of SC with respect to trauma-related resilience and recovery is limited. Accordingly, we tested whether SC prospectively predicted reduced levels of posttraumatic stress, depression, panic, and suicidality symptom, as well as well-being outcomes among an at-risk youth sample over the

6 months following exposure to a potentially traumatic stressor.

Consistent with prediction, multi-level modeling of mediation documented that greater levels in SC were prospectively predictive of lower levels or lesser elevations (i.e., were protective) of trauma-related psychopathology symptom outcomes but not well-being. Specifically, in lagged analyses, elevation in SC from T1 to T2 predicted reduction or lesser elevation in posttraumatic stress and panic symptoms at T2 and T3, respectively; SC fully mediated the effect of time on these two trauma-related symptom outcomes. Furthermore, in a non-lagged analysis, greater levels of SC at T1, T2, and T3 were related to reduced levels of suicidality at each time-point, respectively; SC fully mediated the effect of time on suicidality-symptoms. In addition, levels of SC at T1, T2 and T3 were related to lower levels of depressive symptoms at each time-point respectively. In this latter test, SC could not mediate the effect of time because no significant effect of time was observed with respect to depressive symptoms; though it is notable that in the non-lagged model, the effect of time on depressive symptoms neared significance ($p=0.06$) and SC accounted for this effect, consistent with theorized mediation. It is furthermore important to highlight that the observed effects of SC with respect to trauma-related psychopathology symptoms over-time were all unchanged and remained significant above and beyond the (null) effects of dispositional mindfulness.

Together, these novel longitudinal and multi-level mediational data indicate that SC may function as a malleable protective factor with respect to transdiagnostic trauma-related symptoms (i.e., depression, panic, posttraumatic stress, suicidality) among an at-risk sample of youth recently exposed to a potentially traumatic stressor. The findings are novel with respect to the SC and mental health literature (Barnard & Curry 2011; Neff and McGehee 2010; MacBeth and Gumley 2012; Vettese et al. 2011) as well as traumatic-stress risk and protective factors literature (e.g., Bomyea et al. 2012; Brewin and Holmes 2003; Feldner et al. 2007). Furthermore, these findings are consistent with the unique effects of SC on mixed anxiety-depression symptom severity

observed above and beyond dispositional mindfulness (Van Dam et al. 2011); though unlike Van Dam et al., no effect was observed for dispositional mindfulness. However, unlike Van Dam et al., the present study tested mediation, in a longitudinal design, and evaluated associations between these factors following traumatic stress.

Furthermore, we observed significant elevation in posttraumatic stress, panic, and suicidality symptoms, and a trend towards similar elevation in depressive symptoms, over the 6-months following traumatic stress exposure. These effects are consistent with a large body of data documenting the emergence of a range of forms of stress-related disorders among youth and at-risk youth in particular (Costello et al. 2006; Grant et al. 2004). Contextualized in the larger body of developmental psychopathology research related to stress and psychopathology among at-risk youth, these findings also illustrate the importance of selective preventive or selective early intervention for youth who may be at elevated risk for poor adjustment to trauma exposure.

The present study is limited in a number of respects relevant to future work on SC and traumatic stress recovery. First, the study was conducted in Israel, among a convenience sample of youth at-risk. Future research sampling a more diverse population is important for further testing the generalizability of the present findings with respect to at-risk youth from a probability- or community sample. Second, measurement methods were exclusively retrospective and self-report. Evaluation of SC using multi-method experimental measures, such as behavioral or experience sampling methods, are needed. Third, self-compassion was measured following exposure to the PTE. This of course does not permit us to test the possible effect of the traumatic stress exposure on self-compassion levels in the initial days following exposure. To do so, investigators would need to identify youth at-risk prior to trauma exposure and to measure self-compassion or other protective factors in the days/weeks immediately *prior* to the PTE. Doing so however is not readily feasible – unless investigators would focus on identification of youth at-risk of trauma exposure – de facto changing the nature of the population and limiting the context for the study of SC and psychopathology recovery post-trauma. Furthermore, clinically, were self-compassion measured and clinically targeted in a future selective preventive or early intervention among at-risk youth, it would be similarly measured following PTE – as in the present study. Accordingly, knowledge of the role of self-compassion in the days and weeks following trauma exposure for symptom levels over time is important to guide future clinical research and practice.

Fourth, internal reliability of the studied measures ranged from acceptable to excellent; despite the socio-cultural differences in this relative to majority-group samples in past work, there was no overall problem with the reliability of participants' self-report. Specifically, levels of reliability on the

MAAS (dispositional mindfulness) and IDAS (symptoms) were high and similar to past work; the SCS demonstrated more modest levels of internal reliability. It is important to highlight that though psychometrically acceptable, these modest levels of internal reliability of SCS result in a conservative test of the role of SC in recovery post-trauma – notable in light of the robust meditational effects of SC in the present study. Moreover, it is important that future work evaluate the phenomenological nature of SC in at-risk youth samples. We hypothesize that the present reliability data may mean that *some* youth whom experience high levels of self-kindness or a sense of common humanity may *also* experience self-judgment and a sense of isolation. This may well reflect the complex nature of the phenomenology of self-compassion in at-risk youth – an important question for future study that has to received limited attention to-date. Such future insights may have important implications for clinical assessment and practice. Fifth, symptom outcomes were not tested by means of structured diagnostic data. However, use of the IDAS as the primary outcome measure in the present investigation may also be construed as a psychometric strength of the investigation. Indeed, the IDAS was developed to measure multiple concurrent symptom outcomes while maximally distinguishing between individual differences in these variables (Watson et al. 2007). Furthermore, outcomes were limited to internalizing symptoms – the role of self-compassion as a protective factor for the development of externalizing symptoms may be an important extension of the present findings (Carrion et al. 2002; Saigh et al. 2002).

Sixth, though novel with respect to the temporal proximity to trauma exposure and at-risk status of the sampled youth, the sample size was modest. Larger-scale future investigation is important. Nevertheless, the longitudinal design and use of MLM significantly improved the statistical power of the analyses (Preacher and Kelley 2011; Singer and Willett 2003). Seventh, we were not able to directly test whether SC moderates the effect of type or degree of trauma exposure severity on symptom recovery – due to the sample's universal exposure to the traumatic event. Future work in a sample variably exposed to traumatic stress may permit such a test of moderation. Finally, though longitudinal, the study was observational. Participants were not randomized to a preventive intervention targeting self-compassion. This design thus does not permit making causal inferences regarding the observed longitudinal associations between SC and trauma-related symptoms.

In summary, we report novel data with respect to the protective function(s) of SC for trauma-related adjustment and psychopathology vulnerability among at-risk youth. The study has a number of notable strengths, including the unique at-risk youth sample, recent exposure to a potentially traumatic stressor, longitudinal design, high prospective retention rates, lagged multi-level mediation analyses, and psychometrically-sound measurement of symptom outcomes.

The findings may inform the development and investigation of a novel trauma-related selective-prevention or early intervention targeting SC among at-risk youth.

Acknowledgement Dr. Bernstein recognizes the funding support from the Israeli Council for Higher Education Yigal Alon Fellowship, the European Union FP-7 Marie Curie Fellowship International Reintegration Grant, Psychology Beyond Borders Mission Award, Israel Science Foundation, the University of Haifa Research Authority Exploratory Grant, and the Rothschild-Caesarea Foundation's Returning Scientists Project at the University of Haifa. Mr. Zvielli recognizes the support from the University of Haifa President's Doctoral Fellowship Program.

Conflict of Interest The authors declare that they have no conflict of interest.

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